



# APACHE CASSANDRA COURSE SYLLABUS



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## Apache Cassandra Course Syllabus

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### Introduction to Apache Cassandra

#### NoSQL Overview

- ❖ Justifying non-relational data stores
- ❖ Listing the categories of NoSQL Data Stores

#### Exploring Cassandra

- ❖ Defining column family data stores
- ❖ Surveying Cassandra
- ❖ Dissecting the basic Cassandra architecture

#### Querying Cassandra

- ❖ Defining Cassandra Query Language, CQL
- ❖ Enumerating CQL data types
- ❖ Manipulating data from the cqlsh interface

## Representing Data in the Cassandra Data Model

### Leveraging Cassandra structures and types

- ❖ Drawing comparisons with the relational model
- ❖ Organizing data with keyspaces, tables and columns
- ❖ Creating collections and counters

### Modeling data based on queries

- ❖ Designing tables around access patterns
- ❖ Clustering with compound primary keys
- ❖ Improving data distribution with composite partition Keys

## Configuring Data Consistency

### Detailing tunable consistency

- ❖
- ❖ Identifying consistency levels
- ❖ Selecting appropriate read and write consistency levels
- ❖ Distinguishing consistency repair features

### Balancing consistency and performance

- ❖ Relating replication factor and consistency
- ❖ Trading consistency for availability
- ❖ Achieving linearizable consistency with Compare-And-Set

## Leveraging Cassandra Idioms and Programming Patterns

### Working with Cassandra collection types

- ❖ Grouping elements in sets
- ❖ Ordering elements in lists
- ❖ Expressing relationships with maps
- ❖ Nesting collections

### Storing data for easy retrieval

- ❖ Mapping data to tuples and user defined types
- ❖ Investigating the frozen keyword
- ❖ Applying the Valueless Columns Pattern
- ❖ Strategic implementation of clustering columns

### Controlling data life span

- ❖ Expiring temporal data with time-to-live
- ❖ Reviewing how tombstones achieve distributed deletes
- ❖ Executing DELETES and UPDATES in the future

### Constructing materialized views and time series

- ❖ Modeling time series data
- ❖ Enhancing queries with materialized views
- ❖ Materialized views maintained in the application
- ❖ Driving analytics from materialized views

### Managing triggers

- ❖ Creating triggers by implementing ITrigger
- ❖ Attaching triggers to tables
- ❖ Supporting materialized views with triggers
- ❖

### Accessing Cassandra Programmatically

#### Querying Cassandra data with the Datastax Java Driver

- ❖ Connecting to a Cassandra cluster
- ❖ Running CQL through the Java Driver
- ❖ Batching prepared statements
- ❖ Paginating large queries

#### Persisting Java Objects with Kundera

- ❖ Defining the Java Persistence Architecture, JPA
- ❖ Configuring Kundera to work with Cassandra
- ❖ Generating schemas automatically
- ❖ Managing JPA transactions in Kundera

### Integrating Cassandra with Analytical Frameworks

#### Leveraging built-in Cassandra connectors

- ❖ Loading data into Hadoop MapReduce with the Cassandra InputFormat
- ❖ Utilizing the Cassandra Loader to create Pig relations
- ❖ Converting a Cassandra table to a Hive table with the Cassandra serializer/deserializer (SerDe)



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### Implement roles

- ❖ Create and manage roles.

### Configure complex playbooks

- ❖ Configure connection types, delegations, and parallelism.

### Implement Ansible Vault

- ❖ Manage encryption with Ansible Vault.

### Troubleshoot Ansible

- ❖ Troubleshoot the Ansible control machine and managed nodes.

### Implement Ansible Tower

- ❖ Implement Ansible Tower.

### Implement Ansible in a DevOps environment

- ❖ Implement Ansible in a DevOps environment using Vagrant.

### Comprehensive review

- ❖ Review tasks from the Automation with Ansible course

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